

REMARKS

1. Summary of Office Action

In the Office Action mailed January 13, 2010, the Examiner rejected Claims 1-9 under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement, rejected Claims 1-7 under 35 U.S.C. § 103(a) as being allegedly obvious over O'Neill (U.S. Patent No. 5,621,614) in view of Hood, III (U.S. Patent No. 6,038,128), and rejected Claims 8-9 under 35 U.S.C. § 103(a) as being allegedly obvious over O'Neill in view of Hood, III, and further in view of Chang (U.S. Patent No. 6,474,407).

2. Status of Claims

Currently pending are Claims 1-9 of which Claims 1 and 3 are independent, and the remainder of the claims are dependent. Claims 1-3 are presently amended to further clarify the configuration of the heat exchanger. Applicant submits that no new subject matter has been added.

3. Response to the Rejection under 35 U.S.C. § 112, first paragraph

The Examiner rejected Claims 1-9 under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement. Specifically, the Examiner alleged that it is unclear how the walls are arranged with respect to the thermo electric cooling unit ("TEC"), and how the system will work to provide cooling to the component.

Applicant respectfully submits that Figure 4 and paragraphs [17] and [26]-[28] of the originally filed specification provide sufficient evidence to show that the inventor had possession of the claimed subject matter, and hence provides a sufficient written description under Federal Circuit case law. Figure 4 clearly shows the arrangement of the walls (500) with respect to the TEC (100). Additionally, paragraph [26] describes the configuration shown in Figure 4. A housing wall (500) is formed on an upper side of a

plate (110) of the TEC exchanger, and another housing wall (500) is formed on a lower side of a plate (120) of the TEC exchanger. In addition, Figure 4 and paragraphs [17] and [27]-[28] further describe the configuration and operation of the heat exchanger.

The Examiner also poses a number of questions regarding how the system will work to provide cooling. Specifically, the Examiner asks whether the TEC is exposed to both internal and external airflows, or whether the wall assembly forms a seal between the TEC unit. The claims do not recite these limitations. In making this rejection, the Examiner is requiring enablement or written description of limitations not found in the claims. All that is necessary and sufficient to enable the claims is that one of ordinary skill in the art be able to construct the configuration described to achieve a compact thermal heat exchanger. One of ordinary skill in the art would know how the heat exchanger works by reviewing the specification and Figure 4.

For the foregoing reasons, Applicant submits that the specification provides sufficient support to show that the inventor had possession of the subject matter of Claims 1-9, and therefore requests that the Examiner withdraw the rejection under 35 U.S.C. § 112.

4. Response to the Rejections under 35 U.S.C. § 103(a)

The present application is directed to a thermal exchange device configured to be more compact to reduce the space required by the device. To achieve a compact cooling unit that is still effective, a pair of housing walls with fans that are offset from each other is designed around the unit. The TEC comprises a first planar plate and a second planar plate. Heat pipes are positioned laterally, in opposite directions, off of plates. A plurality of fins is formed on each of the heat pipes. One of the fans, "an external fan," is provided over the fins on the first heat pipe to inspire air from outside the

housing, and another fan, "an internal fan," is provided under the fins on the second heat pipe for processing air within the housing. Claim 3 recites similar features as Claim 1.

The positioning of the two laterally extending heat pipes *in opposite directions* allows for the offset placement of the fans, as the fans lie above and below the extended portion of each heat pipe, and thus reduces the space required by the heat exchanger.

A. Claims 1-9 are Allowable Over the Cited References

The Examiner rejected Claim 1 as being allegedly obvious over O'Neill (U.S. Patent No. 5,621,614) in view of Hood, III (U.S. Patent No. 6,038,128). The Examiner also rejected Claims 8-9 under 35 U.S.C. § 103(a) as being allegedly obvious over O'Neill and Hood, III, and further in view of Chang (U.S. Patent No. 6,474,407).

Applicant respectfully submits that Claims 1-9 are allowable over the cited references, because neither of the cited references teach a number of the features recited in independent Claims 1 and 3.

First, neither O'Neill nor Hood, III teach two heat pipes extending in opposite directions. Specifically, neither reference teaches "a first heat pipe ... extends laterally beyond the first planar plate in a first direction; a second heat pipe ... extends laterally beyond the second planar plate in a direction opposite to the first direction," as recited in independent Claims 1 and 3.

The thermoelectric unit in O'Neill shows the conventional heat exchanger configuration (Fig. 3) using heat sinks, which is described in the background and shown in Figures 1 and 2 of the present application as a "conventional" configuration for a heat exchanger. The present application notes the limitations of this conventional configuration, and addresses these limitations with a different configuration to maintain effectiveness while being compact. The unit in O'Neill does not even disclose heat pipes, let alone heat pipes that extend laterally from the TEC and in opposite directions,

as recited in Claims 1 and 3. The Examiner concedes in the Office Action that O'Neill fails to disclose heat pipes, but cites Hood, III for providing a heat pipe with fins. Hood, III, however, only shows a single heat pipe. Hood, III does not disclose heat pipes that extend laterally from the TEC in opposite directions.

Additionally, neither O'Neill nor Hood, III teach "an external fan provided over the fins on the first heat pipe that draws air outside the housing into the housing," and "an internal fan provided under the fins on the second heat pipe that circulates air within the housing."

O'Neill also does not teach an external fan provided over a portion of a heat pipe and an internal fan provided under the second heat pipe, as O'Neill does not teach heat pipes, but instead only discusses heat sinks. As previously discussed, Hood, III only teaches a single heat pipe. Thus one of the fans, in this case the external fan (12b), is not provided over any heat pipe. Neither reference teaches the two fans positioned in relation to the heat pipes as recited in Claims 1 and 3.

Finally, neither O'Neill nor Hood, III teach "a first housing wall...positioned on the first planar plate of the thermal electric cooling unit" and "a second housing wall...positioned on the second planar plate of the thermal electric cooling unit."

As shown in Figure 3, O'Neill teaches the TEC unit is affixed to heat sinks (82, 92) on either side, and an insulation panel (36) and a mounting plate (100) on top and bottom. Covers (84, 94), which still are not the housing, are positioned around the heat sinks, and not on the plates of the TEC unit. The housing is formed around the configuration of support trays and holding brackets, not on, let alone even close to, the plates of the TEC unit.

Claims 8-9 depend from independent Claim 3. Chang was cited in addition to O'Neill and Hood, III solely for teaching a high density fin stack. Chang, however, does

not teach heat pipes, let alone the configuration heat pipes recited in Claim 3, and thus does not cure the above-described deficiencies of O'Neill and Hood, III.

B. The Rejection is not Based on A Rational Basis

To properly support rejection under 35 U.S.C. 103, the Office must provide articulated reasoning with rational underpinnings as detailed in the MPEP at 2141 (III). The Office has not provided articulated reasoning with some rational underpinning why O'Neill in light of Hood, III or Chang makes obvious the compact configuration described in the claims.

As previously discussed, O'Neill shows a classic heat exchanger configuration. O'Neill is not concerned with providing a compact unit. Instead, O'Neill is concerned with creating a new type of housing that has extra features such as support trays and mounting brackets that stand between the housing and the TEC unit. These extra features will add to the size, not create a more compact design. The fans in O'Neill are shown to be in line with each other as well as in line with the items in between the fans, such as the electric unit, the hot sink, and the cold sink. There is no mention of a configuration that creates an offset within this lineup of components to provide a compact unit. The heat exchanger shown in Hood, III is also not concerned with compactness. Instead, Hood, III shows a winding, L-shaped configuration. Moreover, Hood III only uses a single heat pipe with this winding configuration. There is no attempt in Hood, III to have multiple heat pipes and yet to keep the configuration compact by laterally extending the heat pipes in opposite directions from a thermal exchange unit. There is not an attempt in Hood, III to compact a linear arrangement. Chang also fails to describe a compact configuration for a thermoelectric cooling unit.

Objectively, one faced with the teachings of O'Neill, Hood, III and Chang would have no logical reason to make O'Neill more compact by creating the heat pipe

configuration recited in the claims. Because the proposed combinations would not logically lead to the invention of Claims 1 and 3, *prima facie* obviousness of Claims 1 and 3 over O'Neill, Hood, III and Chang does not exist.

In light of the discussions above, Applicant submits that independent Claims 1 and 3 are in condition for allowance. Further, Applicant also submits that Claims 2 and 4-9 are also allowable by virtue of their ultimate dependency from Claims 1 or 3.

5. Conclusion

Applicant submits that the application is in good and proper form for allowance and respectfully requests the Examiner to pass this application to issue. Because the independent Claims 1 and 3 are allowable, the dependent claims are allowable for the same reasons.

Respectfully submitted,

McDONNELL BOEHNEN
HULBERT & BERGHOFF LLP

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By: /Nicole E. Reifman/
Nicole E. Reifman
Reg. No. 58,792